Hong Kong, a variety of public transportation services includes minibuses that carry workers to residential areas. The fares are slightly higher, but the service is better, with the smaller buses acting almost like taxis, picking people up and dropping them off on demand.

When an express bus lane was created in Abidjan, travel time on public transport was halved in just six months. After one-way streets were established, delays were reduced 26 percent. •

Around the World

Japan's Aging Workforce

Like the United States, Japan experienced a post-World War II baby boom, but while the boom lasted about 18 years in the U.S. it lasted only three years in Japan. As a result, Japan's labor force is aging more rapidly than that of the U.S.

How Japan copes with this problem will become a model for other Asian countries such as Taiwan and the Republic of Korea, according to researcher Linda G. Martin.

Martin suggests that Japan will be able to cope with the aging labor force because its wage system is reasonably flexible and government and private enterprise are devising innovative policies to accommodate the older labor force.

Some firms, particularly those with more than 30 employees, have been reluctant to allow workers to stay on past the age of 55 unless they agree not to have their wages and retirement benefits so closely tied to length of service. The Japanese government, however, encourages employers to continue workers past age 55 and to hire older workers. Subsidies, retaining incentives, and tax incentives have been offered for firms that continue workers beyond normal retirement age or recruit new employees from the ranks of the 55 to 64 age group.

Other ways Japan could cope with its aging labor force, Martin says, are to employ more women, encourage families to have more children, or encourage immigration to Japan by younger workers. Another alternative may be to send labor-intensive production work to labor-rich countries.

Source: "Japanese Response to an Aging Work Force" by Linda G. Martin, in *Population Research and Policy Review*, January, 1982, Elsevier Scientific Publishing Company, P.O. Box 211, 1000 AE Amsterdam, The Netherlands. Three times a year. $60.

African Family Plans

Nineteen African governments think their country's population growth is too high, 5 believe it is too low, and 26 think it is "satisfactory."

The attitudes are reported in the first in a five-part series of tables being produced by the Population Reference Bureau as an overview of the role of population growth in future development.

Besides indicating the official government perception of population growth, the first table also briefly summarizes family planning availability and the reason for encouraging family planning. Thirty-six African countries cite maternal and child health as the reason for permitting family planning.

Government support of family planning appears to be strongest among those countries wishing to limit population growth for "demographic" reasons (i.e. "a specific goal of reducing the population growth rate by encouraging smaller family size").

The PRB gives Ghana as an example of a country that has set a goal of reducing the growth rate from 3.1 to 1.8 percent by the year 2000.

Source: *Intercom*, The Population Reference Bureau, Inc., 1337 Connecticut Ave., N.W., Washington, D.C. 20036. Annual membership in the PRB is $25/individual and $100/institutional.

Europe's Housing Shortage

In some European countries, courtships of three to five years are not uncommon as couples wait until an apartment opens so they can get married and have a place of their own.

There is no relief in sight from the tight housing market.

One agency argues that Britain was short 240,000 homes in 1981 and predicts that by 1986, 450,000 new units will be needed.

In 1979, the latest year for which complete figures are available, the total number of dwellings completed in the nations of the European Community was 1.4 million, down sharply from the 1.8 million built in 1975.*

Some of the problem stems from Europe's post-World War II baby boomers who have grown up and want their own homes. Europe's baby boom was more pronounced than that in the U.S. and its subsequent drop in fertility has also been greater.

And, as in the U.S., the tight money market has contributed to the housing troubles, as has the soaring price of land.

Source: *Europe: Magazine of the European Community*, March/April 1982, 2100 M Street NW, Suite 707, Washington, DC 20037, (202) 862-9500. Bimonthly, $9 a year.

*Members of the European Community: Belgium, Denmark, Federal Republic of Germany, France, Ireland, Italy, Luxembourg, Netherlands, United Kingdom, Greece. •

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Measuring the Accuracy of Age Data

Along with vital statistics (births and deaths), statistics on age and sex are demography's building blocks. The age distribution of a country's population has an impact on its social and political structure, and the level of economic activity.

Every national census collects age data, as do many administrative records systems. Because age data are vital to firms that sell consumer goods it is important to be able to assess the quality of the data. In the developed countries, age reporting for administrative purposes is commonplace and questions on age are included in every modern census.

Age data are subject to a variety of errors. This article focuses on one kind of reporting error — age heaping — that results from the tendency of census enumerators or respondents to favor certain numbers when reporting age.

The United Nations defines age as "the estimated or calculated interval of time between the date of birth and the date of the census, expressed in completed solar years." This is the Western concept of age. There are areas in the world, particularly in the Orient, where age is defined differently. In some cultures, the date of birth may have no cultural meaning. Yet age data are typically collected in national censuses by asking for the respondents' age at last birthday, or date of birth. In some national censuses, like the United States census, both questions are asked — current age and date of birth — and the information on date of birth is used as a check on reported age.

Both questions assume that the respondent has a clear idea of when he or she was born. This may not be true for countries with low levels of education and for elderly respondents. The date of birth may not have been recorded, or elderly respondents simply may not remember when they were born.

When a respondent is uncertain, age must be estimated. Both the respondent and the census enumerator may have certain biases that can result in errors.

The most common form of age heaping occurs when respondents or enumerators favor ages ending in "0" or "5." When this occurs there also is a dislike of ages ending in "1" or "9." The result, in countries where this is a problem, is too many people at ages ending in "0" and "5' and too few people at ages ending in all other digits. A variation of this kind of "digit preference" occurs when respondents report a year ending in "0" as their year of birth. If the census is conducted in a year that ends in "0," the result may be a preference for that digit. If the census is conducted in a year ending in "5," that digit may be preferred. Censuses conducted in years ending in other digits will show different patterns of preference.

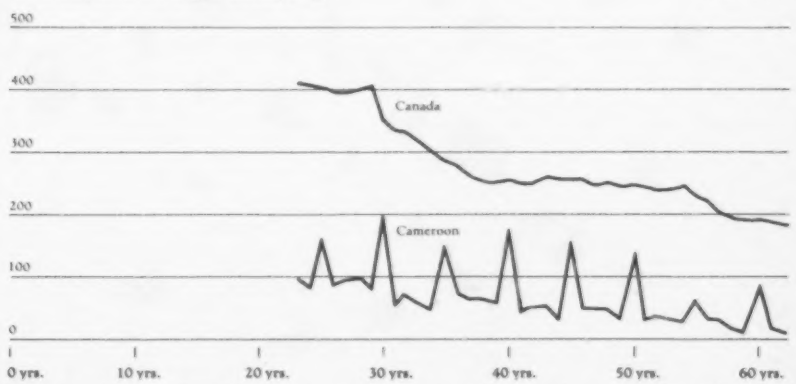
Other forms of digit preference occur less frequently than the "0" and "5" preference. Even numbers are often favored over odd numbers; the age "0" (before a child's first birthday) is usually underreported, and there may be avoidance of certain numbers for superstitious or cultural reasons. People in the Western countries, for example, tend to avoid the number 13.

Age heaping is most obvious in population data reported by single years of age. By grouping a population into 5-year or larger age groups, a researcher can minimize the impact of age heaping. However, for some analysis the finer age detail is necessary, and age heaping can cause problems.

Because the preference for reporting age in digits ending in "0" and "5" is so widespread, researchers have devised indexes to measure the preference for these digits. The most commonly used is Whipple's Index, which measures heaping on "0," or on both "0" and "5." If used to measure heaping only on "0," the index is constructed by dividing the sum of the age groups with ages ending in "0" by one-tenth of the total population. This index is usually restricted, however, to the age range 23-62 because ages outside that range are subject to many more

continued on page 9

Population By Age:
The Effects of Age Heaping



Single year of age data from the 1976 Censuses of Cameroon and Canada show age heaping in Cameroon and none in Canada.

Data Source: United Nations

Country Profile

The Republic of Singapore

An executive in Singapore's largest industry, electronics, might not buy snake bile and rice wine to cure rheumatism, but if one of the industry's 87,000 employees did, he or she could find it in Chinatown. People who work for Singapore's next largest employer, manufacturers of oil rigs, can find plenty of Western theme bars and country music after hours.

Such contrasts are characteristic of Singapore, a cosmopolitan city-state at the crossroads of international trade and finance. Until 20 years ago Singapore still had death houses where elderly Chinese were taken to wait for the end, but a strong central government has directed the country toward modernization by extensive industrialization, urban renewal, and population control.

Urban City-State

Singapore is one of only a few small countries* that are classified as 100 percent urban. It is the only other city-state besides Hong Kong with more than one million residents. Located at the tip of the Malayan Peninsula, the island of Singapore is connected to Johore (West Malaysia) by a causeway. Although the country was once briefly a part of Malaysia, in 1965 it became an independent sovereign republic and member of the British Commonwealth.

Singapore is sometimes called a "garden city" because it is one of the cleanest in Asia. Since becoming the world's third-largest oil refining center, however, Singapore has taken on the additional designation of "Houston East." It is the second-largest manufacturer of off-shore oil rigs and has the world's third busiest port. Because of its location at the intersection of air and sea traffic, Singapore has become a production and distribution base for many international corporations. Singapore's rapid economic growth has moved it from the status of a developing country to that of a developed nation by international standards.

**Others include Hong Kong, Bermuda, Monaco, Gibralter and Macao.*

The extent of Singapore's reliance on foreign trade is reflected in its population figures. On Census Day, June 24, 1980, the government counted nearly 9,000 foreign visitors in hotels and 5,500 ship's crews and passengers. These were in addition to the 2.4 million usual residents the census counted.

Singapore's population grew 16.4 percent during the 1970s, up from 2 million. Most of this growth was due to natural increase (the excess of births over deaths), since immigration was insignificant over the decade. The country is only 230 square miles in size (about the size of Chicago). Its density is one of the world's highest at over 10,000 persons per square mile. A successful family planning policy kept the average annual growth rate at 1.5 percent between 1970 and 1980, compared with an annual rate of 2.8 percent during the 1960s. The population is projected to number 3.1 million by 2000.

Geographic Distribution

The Singapore Census Bureau has divided the island into ten census areas composed of census divisions and census districts. There were 69 census divisions and 215 census districts in 1980.

The ten census areas have been classified into four broad categories according to their distance from the city center (see map). The congested central part in the south central portion of the island is known as the "Central City Area." The second category, The "City Periphery," consists of the Northeast, North, and West census areas just outside the Central City. Beyond the periphery is the "Suburb," also comprised of three census areas (the East, North, and West), and beyond that is the "Outlying Area" which is farthest from the Central City and comprised of the last three census areas (East, North, and West).

SINGAPORE: CENSUS AREAS

Thirty-seven percent of the population lived in the City Periphery in 1980, where most of the high-rise public flats and Queenstown are located. The Suburb accounted for 30 percent of the population, and the Outlying Area for 27 percent of the total. The smallest proportion of the population, 6 percent, lived in the Central City Area.

The Central City Area lost 34 percent of its population between 1970 and 1980, due mainly to urban renewal. All other census divisions gained population.

The Central City Area's population profile was shaped by early migrants who came to Singapore without their families. Its population is older, therefore, with more males than females (a sex ratio of 116 males per 100 females), and a higher proportion of foreign-born residents.

As distance from the Central City Area increases, the population becomes younger. The census area with the most youthful population is Outlying Area-West, which contains the industrial town of Jurong. Outlying Area-West was also the destination of a recent influx of foreign manufacturing production workers.

Ethnicity

The Chinese are the largest ethnic group on the island, 77 percent of the population in 1980. Malays represent 15 percent of the population, and Indians 6 percent. Despite the ethnic mix of the population, the government promotes a strong sense of national identity among Singaporeans. Intermarriage among ethnic groups is rare.

Singapore has a thriving Chinatown. Located on one square mile in the Central City Area near the business district, Chinatown is a food and merchandise market for Chinese ethnics looking for the specialties of their mainland provinces. Business clubs and clan associations for the worship of ancestors are also found there. Chinatown escaped most of the urban renewal of the 1970s that demolished much of the old Central City Area housing.

The religion with the largest following in Singapore is Taoism, (29 percent); close behind is Buddhism (27 percent), followed by Islam (16 percent) and Christianity (10 percent). Thirteen percent of the population do not believe in any religion.

Malays are overwhelmingly followers of Islam (99 percent). The majority of Indians are Hindus (57 percent), but the Chinese show no religious majority: 38 percent are Taoists, 34 percent Buddhists, and 11 percent are Christians.

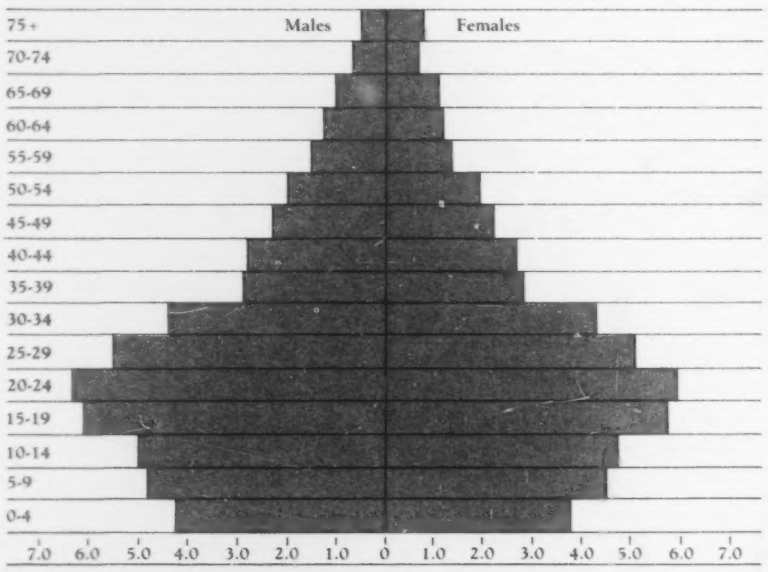
Because the religious traditions of a people influence their attitudes and behavior, advertising campaigns and the choice of products to sell in Singapore must take account of this mixture.

Age Distribution

Singapore's age profile is slightly younger than that of the U.S., but it is aging for the same reasons: declining fertility and aging baby-boom cohorts. In 1970, almost 40 percent of the population were under age 15 and less than 6 percent were aged 60 and over. In 1980, approximately 27 percent of the population were under 15 and those aged 60 and over were 7 percent of the population.

Singapore: Population by Age, 1980

(percent)



Population of Singapore by Age and Sex, 1980

AGE GROUP (years)	Persons	Males	Females
TOTAL	2,413,945	1,231,760	1,182,185
0– 4	193,684	100,847	92,837
5– 9	223,883	115,770	108,113
10–14	235,556	120,857	114,699
15–19	287,420	148,236	139,184
20–24	296,192	152,832	143,360
25–29	253,531	129,407	124,124
30–34	211,040	107,368	103,672
35–39	135,767	68,882	66,885
40–44	131,475	66,497	64,978
45–49	107,245	54,756	52,489
50–54	93,136	48,322	44,814
55–59	71,384	36,989	34,395
60–64	59,708	29,795	29,913
65–69	49,310	23,737	25,573
70–74	33,344	15,429	17,915
75–79	18,616	7,857	10,759
80 +	12,654	4,179	8,475

Fertility in Singapore has declined as women have postponed marriage, advanced their education, and joined the labor force. Women in the labor force averaged 2.4 children compared with 3.8 for women not in the labor force. Ever-married Malay women had the highest fertility, 3.8 children, while women of other ethnic groups (European and Euroasian) had the lowest, an average of 2.2 children. Chinese and Indian women averaged 3.3 children each.

The government began an active family planning program in 1965. Public health clinics provide contraceptives; abortion on demand was legalized in 1974, and voluntary sterilization is encouraged. No maternity leaves are allowed after the second child, and income tax deductions are permitted for the first two children only. Third children are denied a free public education and other public benefits.

Housing

A "house" in the Singapore census is defined as a building, part of a building, or a covered space used or intended for use by one or more persons as living quarters. Each census house must have its own separate entrance with direct access to a road or street.

Singapore's housing falls into roughly six categories: bungalows and terrace houses (both detached and semi-detached); public flats (built by a public housing corporation or other government body); private flats built by the private sector; shiphouses; attap (thatched) and zinc-roofed houses; and others (labor quarters, a room in a workshop, etc.).

The 1980 census counted 467,000 occupied census houses; another 46,000 houses were unoccupied at the time of the count.

Public flats comprised 72 percent of all housing in 1980, a proportion that increased 181 percent since 1970, when only 39 percent of all housing was built by the government. This expansion in the number of public flats accompanied the demolition of poor-quality attap and zinc-roofed housing and shophouses. The government plans to produce more public flats during the 1980s and further reduce the number of shophouses and attap and zinc-roofed houses.

Households and Families

A private household in Singapore is one or more persons who live together in the same census house and who share common eating arrangements. Also included is a person living with others but having his own eating arrangements.

The census classifies private households according to the number of family nuclei. A family nucleus can consist of a married couple, a single parent with unmarried children, or a grandparent with unmarried grandchildren. There are seven categories of census households, reflecting the broad scope of familial arrangements. The "One-person Household" and "Other No-family Nucleus Household" are households with no family ties. There are three types of "One-family Nucleus"; married couples with or without children, married couples with one parent, and other family nucleus groups. There are two types of "Multi-family Nuclei": One is two generations of the same family; another is households with two unrelated family nuclei. The head of a private household is normally the eldest member or main wage earner.

The number of households grew from 380,500 in 1970 to 509,500 in 1980. This 34 percent growth was approximately twice the population growth rate. Unlike the U.S., this rapid household growth was due not to growth in the number of one-person households but to an increase in the proportion of one-family nucleus households. The increase in this type of household, from 73 percent of all households in 1970 to 78 percent in 1980, reflects the availability of public housing and greater economic independence that enabled young couples to set up their own homes. Multi-family nuclei households have declined from 12 percent to 10 percent of households in the past decade.

The proportion of one-person households declined from 13 percent to 8 percent during the 1970s. This decline has been occurring since the late 1950s, when immigration began to taper off. The early migrants, who were most likely to form one-person households, have either died or returned to their countries of origin. The Central City Area has a disproportionately large share of one-person households — 28 percent. These households are concentrated in dilapidated shophouses in the Kreta Ayer and Telok Ayer census divisions, where they make up two-fifths of all households.

One-family nucleus households comprise 80 percent of households in the Periphery and Suburb. The largest proportion of multi-family households are located in Outlying Area-East (13 percent), Outlying Area-North (13 percent) and Suburb-East (14 percent), where a more traditional extended family system still exists.

Among household heads aged 50 and over, there are a higher proportion of multi-family nuclei households, (18 percent) than among those under 50 (12 percent). Among households under age 30, there are more single-person households, reflecting the presence of large numbers of young foreign workers.

Average household size declined from 5.4 persons in 1970 to 4.7 in 1980. Malays had the largest households, with almost 20 percent containing 8 or more persons (a decline from 31 percent in 1970).

As more households have become affluent, homeownership rates have risen — from 30 percent of all households in 1970 to 55 percent in 1980. Another reflection of growing affluence is the decline in the number of households sharing a house, from 26 percent in 1970 to 12 percent in 1980. The average number of households per house decreased from 1.24 in 1970 to 1.09 in 1980.

Income

Even with 18 percent annual inflation, the real income of Singapore residents has increased. Self-employed persons recorded higher incomes than employees.

For the first time, a question on income was asked on the 1980 census. The Singapore statistical office cautions that because income is a sensitive topic, answers to the question may be unreliable.

In 1980, the average monthly income for a working person was S$585 (about $292 at 1982 exchange rates) 40 percent higher than in 1977.

As might be expected, the professional and managerial positions that require the most education paid the most. The highest earnings were among those in financial and business services, an average of S$929 ($434) per month. The lowest earnings were in construction, S$504 ($252) a month.

The average monthly household income in 1980 was S$1240 ($620). Current income of typical middle-class Singaporeans is about S$960.

People living in bungalows, terrace houses, and private flats had higher monthly incomes than those living in shophouses, attap, and zinc-roofed houses.

Education and Communication

In 1980, 84 percent of Singaporeans aged 10 and over were literate, up from 72 percent in 1970. A larger proportion of males than females are literate — 92 percent versus 76 percent. The number of literate women grew 64 percent between 1970 and 1980 and helped reduce the gap between male and female literacy rates for all ethnic groups. During the past decade, female enrollment in secondary schools increased at double the rate for men.

Of literate persons in 1980, 62 percent were literate in only one of the four official languages — Chinese (Mandarin), Maylay, English and Tamil. The largest group were literate in Chinese; second were those literate in English. Thirty-eight percent of the literate population were multi-lingual, almost double the proportion in 1970. The younger the age group, the higher the proportion of multi-lingual persons.

Singapore's educational system is voluntary. Among Singaporeans aged 6 to 17 in 1980, 85 percent were attending school, which is taught in all four official languages. English is considered the language of upward mobility, leading to white-collar jobs. It is the principal language of business, government, and education. As a consequence, the number of enrollments in English-speaking schools has been increasing.

Singapore's educational statistics show the "highest qualification" attained. This is the highest grade a person has passed or the highest level where a certificate, diploma, or degree was awarded.

Of the 1.6 million persons aged 10 and over in 1980, fully 35 percent had no educational qualifications. Forty-four percent had a primary education, 18 percent had secondary and upper secondary qualifications, and about 3 percent had attended college. Although the number of Singaporeans with secondary or higher qualifications has increased about 180 percent since 1970, the supply of highly educated workers has barely kept pace with the economy's demand for skilled and managerial labor. Many multinational corporations bring in their own skilled personnel or recruit labor from other Asian countries.

Radio and television communications cover almost the entire island. The Singapore Broadcasting Corporation Act of 1979 requires a license of anyone using a radio or television in their homes or cars. There were almost 400,000 radio and television licenses issued in 1980, up from 156,000 in 1970.

Radio and television programs are broadcast in all four official languages, and television programs usually are subtitled in a second language. Newspapers had a daily circulation of 616,000 in 1980, compared with 394,000 in 1970. Chinese newspapers have 50 percent of the market. English newspapers account for 44 percent of circulation, and Malay and other languages account for the remaining 6 percent. English-language circulation grew by 64 percent between 1970 and 1980, compared with a 56 percent growth of Chinese-language circulation.

Singaporeans are more likely to use bicycles than cars. A system of taxes on automobiles discourages car buying. Over 570,000 bicycles were registered in 1980, compared with 152,000 private cars. Motorcycles and scooters are the next most popular form of transportation, with 118,000 registered in 1980. Growth in the number of cars and motorcycles was moderate (7 percent and 12 percent, respectively) compared with that of bicycles (53 percent) between 1970 and 1980. The government's fight against pollution and congestion is working.

Over 700,000 telephones were installed in 1980. This was a tremendous increase from 1970, when only 161,000 phones were installed. There is approximately one telephone for every four people on the island.

The Labor Force

Singaporeans aged 10 and over are classified as "economically active" (working persons and those unemployed but looking for work) or "economically inactive" (neither working nor looking for work). Of the population aged 10 and older in 1980, 56 percent, or about 1 million, were economically active.

continued

Households by Household Income and Type of House, 1980 *(in percent)*

Monthly * Household Income ($)	Total	Bungalows & Terrace Houses	Public Flats	Private Flats	Shop-houses	Attap & Zinc-roofed Houses	Others
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Below 500	24.9	13.1	23.2	18.7	47.3	30.7	55.0
500 — 999	31.7	10.7	36.5	11.6	24.2	32.3	26.6
1,000 — 1,499	16.7	9.8	18.6	9.5	11.6	18.1	9.0
1,500 — 1,999	9.6	10.1	10.1	8.1	6.1	9.2	3.4
2,000 — 2,999	8.6	18.0	7.7	15.3	5.7	6.3	2.4
3,000 — 3,999	3.5	12.8	2.2	11.9	1.9	1.6	1.3
4,000 — 4,999	1.7	8.6	0.7	7.7	0.7	0.5	0.7
5,000 & Over	2.3	14.1	0.4	14.3	0.9	0.3	1.0
Not Stated	1.0	2.8	0.6	2.9	1.6	1.0	0.6
Mean Income ($)	1,240	2,786	1,048	2,576	817	940	760

*Singapore dollars. A Singapore dollar was worth about 50 cents U.S. at the time of the census.

SOURCE: Singapore Department of Statistics, 1981

SINGAPORE: ARE ASIAN VALUES POSSIBLE?

The postwar economic miracle that catapulted Japan from a defeated nation into the world's third largest economy is the envy of many countries. Especially relevant is the fact that Japan has succeeded despite being a nation poor in most resources — except for people.

For a country like Singapore, which has limited land and no natural resources except its human ones, the lessons to be learned from the Japanese are compelling. That is why the government employs every conceivable means to urge the people of Singapore to use the Japanese as their mentors.

One of the government's primary concerns is labor turnover and work attitude. The term "job-hopping" has crept into the daily conversation of employers and employees, the former as they denigrate workers who move frequently from one company to another, the latter as they defend their quest for a better standard of living. At every turn, reference is made to the Japanese and their work attitudes.

Singapore's government has charged the National Productivity Board with the task of increasing worker productivity. This is necessary for the success of the country's "second industrial revolution," which is predicated on high technology and skilled manpower.

It would seem that the success formula of the Japanese lies in the fact that they are Confucian technocrats. If Singapore wishes to emulate the Japanese model successfully, Singaporeans will need to turn Confucianist and at the same time adopt modern technology as quickly and systematically as the Japanese did generations ago.

The government has taken steps to inculcate Confucian concepts among its people. But it isn't clear how successful these attempts will be in view of the country's heterogeneous population. The Japanese are a homogeneous people, educated in their own language.

Working against the Confucianization of Singapore is the people's basically-Western-oriented education. To begin with, the bulk of the people have been educated in the English language, though they speak and write a Singapore brand of English.

How to make people think in a Confucianist fashion while learning and using the English language with its concomitant Western values and thinking is the problem. Would the Japanese have developed the way they did if they had abolished their language and adopted English or German instead?

What Singapore is trying to do is to adopt the 19th century concept of "Eastern ethics and Western techniques," which modernizers in China and Japan tried to popularize.

Western values and philsophy are to be shunned as they would sow the seeds of decadence. But Western science and technology are to be freely borrowed because they will bring about material wealth and economic growth.

While Singaporeans are better equipped than their 19th century Chinese and Japanese counterparts to introduce foreign technology into the country because they have been educated in the English language, they may, by the same token find it harder to adopt Confucian philosophy and Asian value systems.

—Png Poh-Seng
Training Manager
Oversea-Chinese Banking Corp.

**This article is excerpted with permission from The Asian Wall Street Journal Weekly, May 24, 1982. p. 14. © Dow Jones & Co., all rights reserved.*

Seventy-two percent of men and 39 percent of women are economically active. The female labor force in Singapore has more than doubled since 1970.

Many factories are located in large housing estates with convenient transportation to work. Child-care facilities are expanding and the government grants tax relief for the dependent children of highly educated female professionals.

Because of Singapore's rapid economic growth during the 1970s, foreign labor was actively recruited. The result was an increase in the nonresident labor force from 3 percent in 1970 to 7 percent in 1980. The government estimates that the need to import skilled and professional workers will continue for several years.

Manufacturing was the dominant industry in 1980, employing 30 percent of the total work force. Production of electrical and electronic equipment and appliances employed the single largest number of workers.

Foreign Trade and Domestic Consumption

Singapore is a member of the Association of South East Asian Nations (ASEAN), formed in 1967 for the expansion of trade among the countries of Malaysia, Indonesia, Singapore, the Philippines, and Thailand. U.S. exports to the region in 1981 totalled $8.8 billion, making ASEAN the fifth largest trading partner of the U.S. U.S. exports to Singapore alone equalled $7.2 billion in 1980.

The largest category of U.S. exports into Singapore was machinery and transportation. A close second was petroleum products. Major imports from the U.S. were industrial, electrical, and power-generating machinery; office and business equipment; telecommunications equipment; scientific instruments; chemical products; and transportation equipment.

The Commerce Department has targeted five areas in which the U.S. could profitably export goods to Singapore in the future: metal-working equipment; medical equipment; computers and peripherals; security and safety equipment; and printing and graphic arts equip-

ment, all rapidly growing fields. Sporting goods and recreational equipment also are expected to become a large market in the next decade.

Sources of Information

Detailed data from Singapore's 1980 census are available from the Chief Statistician of Singapore. Release Nos. 1 and 2 provide basic demographic characteristics of the population and cost S$4 (about $2) each. Release No. 3 on Literacy and Education also costs S$4. Release Nos. 4, on Economic Characteristics, No. 5, on Geographic Distribution, No. 6 on Households and Houses, No. 7 on Income, and No. 9 on Religion and Fertility each cost S$8. Release No. 8 is not yet out). These prices do not include postage. Direct orders can be placed with: Chief Statistician, Dept. of Statistics, Maxwell Road, P.O. Box 3010, Singapore 9050. Questions about a specific topic can be answered by Peter Way of the U.S. Bureau of the Census, at (301) 763-2834.

The Singapore Department of Statistics also publishes a "Yearbook of Statistics," which can be ordered for S$5. It is accompanied by a companion volume, Singapore Statistical Charts, which highlights data in graphic form. Its cost is S$11. Both can be ordered from Singapore National Printers Pte Ltd., Publications Sales Division, Ground Floor, Fullerton Building, Singapore 0104.

Foreign Area Studies of The American University publishes an *Area Handbook for Singapore* which summarizes basic facts on the social, economic, political, and military institutions of the country. The research for the 216 page book was completed in Dec., 1976. It can be purchased from the U.S. Government Printing Office, Washington, D.C. 20402. Stock No. 008-020-00651-3; Catalog No. D 101.22 550-184.

The Hong Kong and Shanghai Banking Corporation published a Business Profile Series for Singapore, dated July 1980. A copy can be ordered from 1 Queen's Road Central, Hong Kong. Telephone: 5-2677111. •

—Daphne Spain

Accuracy/ *con't from p. 3*

kinds of error than age heaping alone. In equation form Whipple's Index for measuring heaping on "0" is:

$$\frac{P_{30} + P_{40} + P_{50} + P_{60}}{1/10\,(P_{23} + P_{24} + P_{25} + \ldots + P_{60} + P_{61} + P_{62})} \times 100$$

The index ranges from 100 (no heaping) to 1000 (the entire population is heaped on ages ending in zero).

Whipple's index also can be used to measure heaping on both "0" and "5." In this form the index is the sum of the population in ages ending in "0" and "5" divided by one-fifth of the sum of the population aged 23-62. In equation form, this version of Whipple's Index is:

$$\frac{P_{25} + P_{30} + P_{35} + P_{40} + P_{45} + P_{50} + P_{55} + P_{60}}{1/5\,(P_{23} + P_{24} + P_{25} + \ldots + P_{60} + P_{61} + P_{62})} \times 100$$

The range lies between 100 (no heaping) and 500 (the entire population is heaped on "0" and "5").

There are other indexes of age heaping but Whipple's Index is the simplest to apply.

In order to show the effects of age heaping, age data from Canada and the United Republic of Cameroon are shown in the chart. Both countries conducted censuses in 1976. Only the data within the range measured by the Whipple's Index is included in the chart.

The results speak for themselves. There is little visual evidence of age heaping in the census results from Canada, but in the results from the Republic of Cameroon there are peaks at ages ending in "0" and "5." In addition, there is a consistent dip in the distribution at ages ending in "9."

After measuring the extent of age heaping in the data from the Republic of Cameroon, the question of what to do about it still remains. One way to minimize the impact of heaping is to group the data into 5-year, or larger, age categories.

When age grouping is inappropriate, however, the solution is to mathematically smooth the age data. Such techniques as quadratic interpolation, polynomial interpolation or osculatory interpolation do this.

In conclusion, when age data are important it pays to check them for errors. Age heaping is not a problem in North America or Western Europe, but most other countries will show some heaping. The problem is most severe in the least developed areas of the world. •

—Michael J. Batutis, Jr.

Accuracy Ratings of Census Age Data

Whipple's Index was used by the United Nations to rate the age data from national census held between 1970 and 1979. The U.N. developed five categories of age data based on Whipple's Index. The categories and the ratings for some countries are listed below:

Category I: Highly accurate data
Less than 105

Luxembourg 1970
Maldives 1974
Mauritius - Island of Mauritius 1972
Monaco 1975
Netherlands Antilles 1971
Niue 1976
Norfolk Island 1971
Norway 1970
Poland 1970
St. Pierre and Miquelon 1974
Samoa 1971
San Marino 1976
Sweden 1975
Tonga 1976
Uruguay 1975
Australia 1976
Austria 1971
Canada 1976
Channel Islands Jersey 1971
Christmas Island 1971
Cook Islands 1971 and 1976
Cuba 1970
Denmark 1970
Faeroe Islands 1977
Finland 1975
Germany, Federal Republic of 1970
Greenland 1976
Isle of Man 1976
Italy 1971
Japan 1975
Korea, Republic of 1975

Category II. Fairly accurate data
(105-109.9)

Barbados 1970
Fiji 1976
Greenland 1970
Mauritius Rodrigues 1972
Spain 1970

Category III: Approximate data
(110-124.9)

Belize 1970
Chile 1970
Costa Rica 1973
Greece 1971
Guyana 1970
Portugal 1970
St. Kitts-Nevis -Anguilla 1970
Trinidad and Tobago 1970
Venezuela 1971

Category IV: Rough data
(125-174.9)

Bolivia 1976
Ecuador 1974
El Salvador 1971
Guatemala 1973
Haiti 1971
Honduras 1974
Iran 1976
Kuwait 1975
Libyan Arab Jamahiriya 1973
Togo 1970

Category V: Very rough data
(175 plus)

Bangladesh 1974
Dominican Republic 1970
Nicaragua 1971
United Republic of Cameroon 1976

Source: The U.N. Demographic Yearbook, 1979

Sources

The U.S. Bureau of Labor Statistics

The Bureau of Labor Statistics in the U.S. Department of Labor is an unusual and little-known source of international data. Buried in the Bureau's Office of Productivity and Technology, the economists of the Division of Foreign Labor Statistics and Trade comb statistical reports from countries around the world. They adjust the data to fit the definitions and methods of the U.S. statistics to allow for realistic country-to-country comparisons of living costs, wages, and other labor statistics.

When the BLS asked members of its business advisory committee to help it decide what programs to jettison in response to the Reagan budget cuts, the business group ranked the foreign statistics program the second most valuable within the productivity office, just behind U.S. productivity data and ahead of productivity statistics for individual U.S. industries.

The BLS program is essentially a labor statistics program. Rather than looking at populations in general, it deals with the population that is active in the work force, both as producers and consumers.

Businesses are most interested in the figures that compare the hourly compensation costs for production workers in manufacturing, says BLS economist Patricia Capdevielle. Whether they are considering producing abroad or want to evaluate the cost conditions their competitors face, U.S. companies want to know how much, on average, businesses are paying in wages and other costs like vacations or pensions.

The BLS series compares costs in 34 manufacturing industries in 33 countries, including the major developing countries, by industry. Those interested in getting on the mailing list for this information can specify the countries or industries they want to keep tabs on.

Given the complexity of productivity measurement, the BLS compares productivity and unit labor costs for only eleven industrial countries. This series goes back to 1950, and is closely watched by government officials charged with monitoring how well our economy is doing relative to our competitors. The BLS releases these figures every May.

Since productivity affects how much wealth a country has to distribute among its population, the BLS compares real domestic product per capita and per employed person for nine industrial countries back to 1950. (New countries are being added now.) Newspaper and television reporters have been saying for some time now that the United States has been falling behind other countries in per capita income, but this judgement is premature according to the BLS figures.

Their figures are adjusted for price parity — they reflect what people can buy with their money — which makes them more meaningful than the simple comparisons journalists use to horrify or gratify the general public. That is because dividing a country's national product by its population and expressing the results in dollars, as the media does, usually tells more about the country's exchange rate policies than it does about its economic progress. In June, the BLS makes preliminary estimates available for the previous year. There is a separate mailing list for people who want to receive this information.

There is yet another mailing list for people who want information on the labor force and employment in industrial countries adjusted to U.S. definitions. Unemployment rates are available on a monthly as well as an annual basis. Labor force participation rates by sex, unemployment rates by age and sex, and employment/population ratios are available on an annual basis only.

The BLS also has data on the population and labor force for 49 countries. These figures, as well as figures on average weekly hours of manufacturing workers in the industrial countries, are published in the "Handbook of Labor Statistics," which the Bureau publishes every two years.

Companies interested in producing or marketing abroad may be interested in comparing consumer prices among countries. The BLS provides monthly consumer price indexes for 11 industrial countries, annual indexes for 15 countries, and monthly percent changes for 9 countries. Another series follows the annual implicit price deflator for consumer expenditures for nine countries. This is the measure of inflation economists generally prefer.

A measure of the living costs for 164 cities in 132 countries has been prepared by the BLS for the Department of State for many years. The State Department uses these indexes to calculate living allowances for its foreign service officers stationed abroad. As part of the BLS' economy moves, the "U.S. Department of State Indexes of Living Costs" is now scheduled to be sold by the Government Printing Office. The tentative cost is $6.50 for a four-issue annual subscription, $1.75 for a single issue.

The economists on the Foreign Statistics staff are so busy producing data that, with the exception of the living cost indexes, they can't spare the time to publish them. New figures don't even get standard BLS press announcements.

Consequently, the only reliable way to keep up with these figures is to get on one or more of the mailing lists the division maintains. The division has a complete "Inventory of Statistics on International Comparison," which shows all the statistics it produces, including those that it only uses internally. Write the Division of Foreign Labor Statistics and Trade, Office of Productivity and Technology, Bureau of Labor Statistics, U.S. Depart-

ment of Labor, Washington, DC 20212, (202/523-9291) for the list, circle the items on the list you would like to see, and return it. If you put your name on a mailing list, specify whether you are interested only in annual data, or whether you want the monthly data when it is available.

Those with computer facilities can access seven of the foreign statistical series via LABSTAT, the BLS data base the National Technical Information Service has made available on computer tape. LABSTAT includes the international productivity indexes, manufacturing compensation costs, unemployment rates, employment totals, and consumer price trends. Contact Stuart Weisman, NTIS product Manager, at (703) 487-4807. •

—Martha Farnsworth Riche

Publications

1982 World Population Data Sheet, prepared by Carl Haub, demographer, Population Reference Bureau, Inc., 1337 Connecticut Ave., N.W., Washington, DC 20036, (202) 785-4664. $1.

This wall chart contains such demographic information as the estimated mid-1982 population, total fertility rate, dependency ratio, urban population, and per capita GNP of 170 countries. Fifteen demographic factors are included for each country and summarized by regions.

1981 World Bank Atlas: Gross National Product, Population, and Growth Rates, 1982, The World Bank, 1818 H Street N.W., Washington, DC 20433. Annual. 24 pp. $2.50.

The *Atlas* presents, in maps and charts, data on per capita gross national product for 1979, population for mid-1979 and GNP per capita and population growth rates for 1970-79 for countries and territories with populations of one million or more.

Six regional maps give the same data for most countries and territories as well as preliminary data for 1980.

Directory of International Statistics, United Nations, Statistical Papers, Series M, No. 56, Rev. 1, Vol. 1. 274 pp. Sales No. E.81. XVII.6. $20.

This is a revised edition of a directory originally published in 1975. Part one lists the names of international organizations that collect data, the names of the publications they produce, the frequency of statistical series, and whether the series is available in machine readable form.

Part two is an inventory of machine-readable data bases of economic and social statistics maintained by international organizations, listed by subject, organization, the type of statistics kept, and the technical description of the computer file. Information in Part two is cross-referenced to Part one.

Canada's Population Outlook: Demographic Futures and Economic Challenges, by David K. Foot, 1982, The Canadian Institute for Economic Policy, James Lorimer & Company, Egerton Ryerson Memorial Building, 35 Britain Street, Toronto M5A 1R7, Ontario, Canada, 250 pp.

Canada is no better prepared to meet the needs of the aging Canadian population of the 21st century than it was to cope with the baby boom of the 1950s, according to this analysis by David K. Foot.

Foot examines population projections for Canada to the year 2050 and comments on their meaning for public policy in such areas as health care, education, labor force, productivity, and economic growth.

Even as Foot, an economist, alters variables to create different scenarios (changing levels of fertility and immigration, for example), he finds there are certain future facts that are inevitable:

—Canada's population will age more in the next 30 years than it did in the entire preceding century.

—In the 2000s, the proportion of elderly people will exceed the proportion of dependent young people for the first time in Canadian experience.

—Canada will have to create 2.25 million jobs and maintain an annual GNP growth rate of 3.7 percent to keep labor force growth from driving up unemployment in the 1980s.

The Female Factor in Japan's Export Market, 1981, Japan External Trade Organization (JETRO), 2-5, Toranoman 2-chome, Minato-Ku, Tokyo, 105, Japan, 36 pp., 1000 yen (about $5), postage not included.

Access to Japan's large middle class is primarily through the female consumer, according to this report which summarizes the purchasing experience and attitudes of 687 Japanese women.

In the 1980s, Japanese women can be expected to purchase more imported housewares, home furnishings, clothes for at-home wear, educational toys, and products for leisure time, according to the survey which emphasized imported goods.

The comments of the women on such items as clothing, food, furniture, domestic hardware, toys, educational materials, sports equipment, and electrical appliances are summarized along with suggestions for adapting products to the Japanese market.

For example, the survey suggests that such items as cutlery and glassware should be packaged in multiples of five, as is the Japanese tradition, and that instructions in Japanese should accompany all items to be used in the kitchen.

As more Japanese women travel outside the country, both with their husbands and on their own business trips, there will be an increase in demand for Western-style items.

Women who had traveled outside Japan were asked what items they had seen in other countries that they would like to be able to buy in Japan. Their responses included mixers, irons, pressure cookers, various kinds of cosmetics, canned convenience foods, floor lamps, all kinds of sheets, towels, and table linens, underwear, jeans and children's clothing. •

Census Update: India

The provisional results of the 1981 census of population in India show that urbanization in that country is increasing, but the growth is taking place primarily in intermediate size cities.

From 1971 to 1981, the urban population grew at an average rate of 3.8 percent annually, compared with 3.2 percent during 1961-1971 and 3.1 percent during 1951-1961, according to an analysis by Nigel Crook and Tim Dyson, published in the March *Population and Development Review*.

"A little under a quarter of the population (23.7 percent) — a total of 156 million people — is now classified as living in urban areas," they write.

Migration from rural to urban areas explains about half the growth of the urban population over the last decade. The most urbanized states are Maharashtra (35 percent) on the west coast which includes the city of Bombay, the adjoining western state of Gujarat with the city of Ahmedabad, and the southern state of Tamil Nadu, where the city of Madras is located. The states of Karnataka, Punjab, and West Bengal also have above average levels of urbanization.

The fastest urban growth is taking place in the states that have been the least urbanized in the past. Few of the top 20 cities grew faster than the urban population as a whole.

The authors say, "the acceleration of India's urbanization is being fueled by the growth of cities in this intermediate range (from 100,000 to 400,000) such as Thane, Bhubanesware, Bokaro Steel City, Ranchi, Bathinda, and Sonipat."

The authors are cautious in linking shifts in urbanization to economic progress, but they do have some observations about the reasons for the shift.

"One major area of enhanced urban growth lies in the 'green-revolution' states of northwestern India, particularly Haryana and Punjab. There has been a distinct upsurge here of nonagricultural activity during the last decade — in small-scale engineering, manufacture of agricultural equipment, and increasingly, consumer durables — with a concommitant expansion in the labor force employed in manufacturing. In contrast, the continued expansion of synthetics and other oil-based industries in Maharashtra and Gujarat has probably made a smaller impact on the factory labor force in these states — for these are highly capital-intensive industries. Finally, at the other end of the spectrum, West Bengal, having acquired a reputation for power shortages and industrial unrest, has certainly failed to attract its share of investment, public or private, over the last two decades."

Population and Growth Rates of the 20 Largest Cities of India: 1981

City	State	1981 population	Average annual growth rate (%) 1961-71	1971-81
Calcutta	West Bengal	9,165,650	2.04	2.65
Greater Bombay	Maharashtra	8,227,332	3.63	3.21
Delhi	Delhi	5,713,581	4.35	4.49
Madras	Tamil Nadu	4,276,635	4.89	2.99
Bangalore	Karnataka	2,913,537	3.21	5.66
Hyderabad	Andhra Pradesh	2,528,198	3.63	3.42
Ahmedabad	Gujarat	2,515,195	3.67	3.61
Kanpur	Uttar Pradesh	1,688,242	2.72	2.81
Pune	Maharashtra	1,685,300	3.61	3.95
Nagpur	Maharashtra	1,297,977	2.99	3.33
Lucknow	Uttar Pradesh	1,006,538	2.16	2.12
Jaipur	Rajasthan	1,004,669	4.39	4.56
Coimbatore	Tamil Nadu	917,155	4.96	2.20
Patna	Bihar	916,102	2.98	6.23
Surat	Gujarat	912,568	4.40	6.16
Madurai	Tamil Nadu	904,362	3.71	2.40
Indore	Madhya Pradesh	827,071	3.51	3.88
Varanasi	Uttar Pradesh	793,542	2.14	2.68
Agra	Uttar Pradesh	770,352	2.22	1.94
Jabalpur	Madhya Pradesh	757,726	3.77	3.48

Reprinted with the permission of the Population Council from Nigel Crook and Tim Dyson, "Urbanization in India: Results of the 1981 Census," POPULATION AND DEVELOPMENT REVIEW 8, no. 1 (March 1982): Table 5.

A New Entry

Belize, which became an independent nation in September, 1981, is now a member of the World Bank and its two affiliated institutions, the International Development Association and the International Finance Corporation.

Belize, located in Central America, has an area of 22,960 kilometers. Its population is about 138,000. Its gross national product per capita was $1,030 in 1979. The capital city is Belmopan.

Syria

Syria's 1981 census, its third, counted 9.2 million people, a 45 percent increase over the 1970 count. Population growth in Syria has averaged 3.46 percent in the last decade, higher than the 1960s rate of 3.28 percent, and among the highest in the world, reports *Population*, the newsletter of the United Nations Fund for Population Activities.

Growth rates might have been still higher, a report from the Central Office of Statistics in Syria said, but for net out-migration and lowered fertility rates.

Better health services and drinking water have resulted in a drop in infant mortality rates and a general reduction in death rates.

The number of households in 1981 was 1.5 million. Average family size per household increased from 5.9 in 1970 to 6.2 in 1981. •

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Jon Crispin

Soviet Foreign Trade is More Important

The Soviet union relies more heavily on foreign trade than researchers in Western countries previously believed, according to a new report from the U.S. Census Bureau.

"The long held notion that Soviet foreign trade is unusually small for an industrialized nation should be discarded," says a report by Vladimir G. Treml and Barry L. Kostinsky, in an analysis for the bureau's Foreign Demographic Analysis Division.

"Foreign trade has clearly played an increasingly significant role in the Soviet economy, with a growing dependence on imports in some branches (machinery, consumer goods, chemicals) and increasing importance of foreign markets for others," the analysts report in "The Domestic Value of Soviet Foreign Trade: Exports and Imports in the 1972 Input-Output Table."

New information recently published in the Soviet Union allowed the Census Bureau analysts to revise their estimates of the domestic value of the Soviet foreign trade.

Until recently, the consensus was that exports and imports each comprise about 3 to 5 percent of national income as the Soviets define it. These estimates are in error, the census bureau analysts now believe.

The reason Western researchers have not recognized the importance of foreign trade to the Soviet Union before this, the analysts say, is that they have had to estimate the ratio of exports and imports to national income. Soviet statistics do not offer these data and the prices listed for exports and imports are different than those charged in the domestic market.

"The foreign trade participation ratio, that is, the ratio of the foreign trade turnover (exports plus imports) to national income is a direct reflection of a nation's dependence on foreign trade," the report explains.

On the basis of new calculations, the census bureau concludes:

—The ratio of Soviet exports to national income is higher than had been believed earlier. In the 1970s, exports (excluding gold) averaged about 6.5 percent of national income and rose to 7 percent by 1980.

—The ratio of Soviet imports to national income is several times higher than had been previously recognized. It rose from about 9 percent in 1970 to about 20 percent in 1980.

—Imported machinery comprises from 15 to 20 percent of all newly installed equipment in the U.S.S.R..

—Imported consumer goods and agricultural products count for

continued

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about 15 percent of all consumption.

The import ratio is unusually high for a country the size of the U.S.S.R. and suggests a somewhat unexpectedly high dependence on foreign trade, according to the analysts.

Although the Soviet Union relies on the socialist bloc countries for some trade, at least 50 percent of their imports in 1981 came from non-socialist bloc countries, including at least one third of the machinery imported and about 60 percent of imported foodstuffs. •

Around the World

Private Enterprise Can't Do It All

The "magic of the market place" can not do everything to assist poor nations, according to the new Planning and Development Minister in Pakistan.

Mahbub Ul Haq, who recently left The World Bank after 12 years, told the IPS Third World News Agency that he fears the elimination of world poverty is "moving into the background in national and international thinking."

While there is rhetoric about supply-side economics and the private sector, Ul Haq said, "To condemn poor nations and poor people to the magic of the marketplace is to condemn them to perpetual poverty. Many of these nations and people are just on the fringes of the market or fall outside it. They are the forgotten majority within nations and the forgotten nations within the international community."

Ul Haq said in the last 10 years commercial banks devoted less than 3 percent of their credits to developing countries with per capita incomes of under $300 and that these nations gained the benefits of less than 2 percent of the expansion of trade.

"To invoke free market ethics or the role of the private sector for these nations is either hypocritical, or cynical, or just naive."

Ul Haq said the private sector will not build schools, hospitals, or roads, nor will it invest in energy sources such as firewood and hydropower that require substantial time or risk.

Source: *Population*, United Nations Fund for Population Activities Newsletter, April, 1982, Information and Public Affairs Division, UNFPA, 220 East 42nd Street, New York, NY 10017. Free.

Battle Brewing

Papua, New Guinea is the site of a price battle between two of Asia's best known brewing companies.

Located north of Australia, Papua New Guinea, population 3.3 million, is known as a place where tribal wars are still a problem. But the war between the two breweries is reportedly costing the government millions of dollars in taxes and worrying the anti-liquor lobby, which fears tribesmen will drink themselves into more bloodshed than usual.

The two companies are subsidiaries of Manila's San Miguel Corp. and Singapore's Malayan Breweries Ltd.

In an attempt to grab a bigger market share, San Miguel did market research to learn that beer is a man's drink in Papua, New Guinea and that drinkers can't read, even when they haven't been drinking.

San Miguel responded to its research with a bold graphics design and a stronger, darker beer. It also committed money to sponsorship of the country's national and international rugby matches. People don't have television, so they watch rugby. A system of premiums with the distinctive San Miguel colors was integrated into the rugby program including sports bags, team uniforms, and tee shirts.

San Miguel's strategies are apparently working. Its market share has increased from 15 percent to 25 percent or 30 percent depending on whose assessment is accepted.

The government, church groups, and politicians are also alarmed by the beer war. Because Papua, New Guinea taxes beer, estimates are that the government will lose close to $10 million this year because of lower beer prices. Politicians and church leaders blame excessive drinking on the reduced prices.

Both companies apparently hope the government will intervene before financial damage to the firms results. But each brewery says it will win in the end.

Source: *The Asian Wall Street Journal Weekly*, June 7, 1982, 22 Cortlandt Street, New York, NY 10007. © by Dow Jones & Co., Inc., $96/year.

Whig Watch

The British watch more television than any other nationality in Europe. At least that is what the French say.

A French Ministry of Culture report said the British watch an average of 155 minutes a day, followed by the Belgians with 139 minutes, the West Germans 137 minutes, and the French 124 minutes.

The ministry reported that of all French people over age 15, 83 percent have a television. French video cassette recorder ownership at the end of 1981 was 500,000 and is predicted to reach one million by the end of 1982.

Source: *Advertising Age*, June 7, 1982, Crain Communications, Inc., 740 Rush St., Chicago, IL 60611, (312) 649-5200. Semi-weekly, $40 a year.

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